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10/647,644	08/25/2003	Mark Eric Obrecht	6002-00602	2528

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EXAMINER
SHERKAT, AREZOO

ART UNIT	PAPER NUMBER
2131	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/647,644	OBRECHT ET AL.
	Examiner	Art Unit	
	AREZOO SHERKAT	2131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 June 2008</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *105,107,109-115,117,118,127-156,159 and 162-166* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *105,107,109-115,117,118,127-156,159 and 162-166* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>6/6/2008</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

Response to Amendment

This office action is responsive to Applicant's amendment received on 6/6/2008.

Claims 105-107, 109-118 and 127-167 were pending in the application. Claims 106,

116, 157-158, 160-161 and 167 have been canceled. Claims 105, 107, 115, 118, 127-

128, 135-139, 142-143, 145, 147-148, 152, 155, 159 and 164 have been amended.

Therefore, claims 105,107, 109-115, 117-118 and 127-156, 159, 162-166 are now

pending in this application.

Response to Arguments

Applicant's arguments with respect to claims 105-107, 109-118, and 127-167

have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 105, 107, 115, 117-118, and 127-167 are rejected under 35 U.S.C.

103(a) as being unpatentable over Kouznetsov, (U.S. Patent No. 6,973,577), in view of

Chess et al., (U.S. Patent No. 6,772,346 and Chess hereinafter).

Regarding claims 105, 115, 117, 127-128, 151-152, and 159-167, Kouznetsov

discloses a computer-implemented method comprising:

selecting an active program on a computer system as code under investigation

(i.e., wherein code under investigation is each of the incoming system calls 91,92, and

93 generated by the applications 33, 34, and 35 (shown in figure 2))), wherein

the program is running on the computer system in a manner that permits the program to

infect the computer system (col. 5, lines 18-65 and col. 6, lines 1-30); and

and successively executing each of the first and second plurality of detection

routines (i.e., static analyzer 52 and dynamic analyzer 53)(col. 4, lines 47-58), wherein

said executing includes:

applying the detection routine to the code under investigation to obtain a result,

weighting such result to obtain a score indicative of whether the code under

investigation has characteristics and/or behaviors typically associated with malicious

code (i.e., static analyzer 52 performs behavior checking and generates alerts and

histograms only if patterns of suspicious events are observed. Dynamic analyzer 53

analyzes histograms and identifies behavioral repetitions within the histograms which

indicate behavior characteristic of a computer virus/compromise)(col. 4, lines 38-67 and

col. 5, lines 1-7);

using the score (i.e., the results indicated by static analyzer 52 and dynamic analyzer 53) to categorize the code under investigation with respect to the likelihood of the code under investigation compromising the security of the computer system (i.e., computer viruses are self-replicating program code which often carry malicious and sometimes destructive payloads and "malware" can include Trojan horses, hoaxes, and spam mail - col. 1, lines 45-48)(col. 5, lines 18-67 and col. 6, lines 1-30);

using the score to categorize the code under investigation with respect to the likelihood of the code under investigation compromising the security of the computer system (i.e., computer viruses are self-replicating program code which often carry malicious and sometimes destructive payloads and "malware" can be categorized in the following: Trojan horses, hoaxes, and spam mail - col. 1, lines 45-48)(col. 5, lines 18-67 and col. 6, lines 1-30).

Kouznetsov does not explicitly disclose a weighing functionality that scores/determines the monitored events/code under investigation as valid/non-malicious code.

However, Chess discloses applying a detection routine to the code under investigation to obtain a result, weighting such result to obtain a first score indicative of whether the code under investigation has characteristics and/or behaviors typically associated with malicious code with valid code (i.e., files determined to be non-malicious)(col. 5, lines 55-67 and col. 6, lines 1-21), and applying a second detection routine to the code under investigation to obtain a second result, weighting such second result to obtain a second score indicative of whether the code under investigation has

characteristics and/or behaviors typically associated with malicious code (col. 6, lines 19-29);

Chess further discloses upon completing the executing of the first and second plurality of detection routines, using the first **and/or** second scores to categorize the code under investigation with respect to the likelihood of the code under investigation compromising the security of the computer system (i.e., the filtering step may include the steps of determining whether a file contains known malicious code that is correctly handled by an existing protection definition)(col. 5, lines 55-67 and col. 6, lines 1-35).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify teachings of Kouznetsov with teachings of Chess because it would allow scoring/determining the monitored events/code under investigation as valid/non-malicious and invalid/malicious code as disclosed by Chess. One of ordinary skill in the art would have been motivated by the suggestion of Chess to filter out undesirable mails (i.e., files) from client inboxes (Chess, col. 9, lines 23-30).

Regarding claims 107 and 118, Kouznetsov discloses the method of claim 105, further comprising:

selecting an active program on a computer system as code under investigation (i.e., wherein code under investigation is each of the incoming system calls 91,92, and 93 generated by the applications 33, 34, and 35 (shown in figure 2))), wherein the program is running on the computer system in a manner that permits the program to infect the computer system (col. 5, lines 18-65 and col. 6, lines 1-30); and

and successively executing each of the first and second plurality of detection

routines (i.e., static analyzer 52 and dynamic analyzer 53)(col. 4, lines 47-58).

Regarding claim 129, Kouzentsov discloses the method of claim 105, further

comprising:

determining from the score (i.e., repetitions of suspicious behavioral patterns)

that the code under investigation is malicious code (col. 5, lines 43-58 and col. 6, lines

63-67 and col. 7, lines 1-10).

Chess discloses determining from the scores (i.e., matches between code under

investigation and the records of database 210 of known non-malicious files or the

records of database 220 of known malicious code descriptions) that the code under

investigation is malicious code (col. 6, lines 5-35).

Regarding claim 130, Kouzentsov discloses the method of claim 129, wherein

the malicious code does not have a known signature (i.e., a knowledge of specific, pre-

identified computer viruses would not be necessary because behavioral patterns typical

of computer viruses are observed. An example of malicious code with unknown

signature is polymorphic viruses)(col. 2, lines 1-2 and lines 21-29).

Regarding claim 131, Kouzentsov discloses the method of claim 105, wherein

the detection routine examines the behavior of the suspicious code under investigation

(i.e., static analyzer 52 performs behavior checking and generates alerts and

histograms, wherein "behavior checking" is monitoring the occurrence of an event from the events list and dynamic analyzer 53 analyzes histograms and identifies behavioral repetitions within the histograms which indicate behavior characteristic of a computer virus, wherein such histograms are not know virus signatures associated with any virus)(col. 4, lines 47-67 and col. 5, lines 1-6).

Regarding claim 132, Chess discloses the method of claim 131, wherein the detection routine examines the behavior of the valid and suspicious code under investigation (col. 5, lines 55-67 and col. 6, lines 1-29).

Regarding claim 133, Kouzentsov discloses the method of claim 105, wherein the detection routine is not specific to the code under investigation (col. 4, lines 15-37).

Regarding claims 135, 142 and 147, Chess discloses the method of claim 105, wherein the determination is made from the first and second scores that the code under investigation is valid code (i.e., files determined to be non-malicious)(col. 5, lines 55-67 and col. 6, lines 1-21).

Regarding claim 138, Kouzentsov discloses the method of claim 105, wherein determination is made from the score that the code under investigation is suspicious code, wherein suspicious code has not been determined to be either valid or malicious code (i.e., the categories of the events that are monitored, e.g., events 1-9, col. 5, lines

25-40 may or may not be malicious depending on the repetitions of suspicious

behavioral patterns ... the observed group of suspicious events could "potentially" be

malicious)(col. 4, lines 38-67 and col. 5, lines 1-67 and col. 6, lines 1-30).

Regarding claim 139, Kouzentsov discloses the system of claim 127, further

comprising program instructions executable by the processor to:

determining from the score (i.e., repetitions of suspicious behavioral patterns)

that the code under investigation is malicious code (col. 5, lines 43-58 and col. 6, lines

63-67 and col. 7, lines 1-10).

Regarding claims 140, 160, and 161, Kouznetsov discloses the system of claim

139, wherein the malicious code is a previously unknown malicious code (i.e., a

knowledge of specific, pre-identified computer viruses would not be necessary because

behavioral patterns typical of computer viruses are observed. An example of malicious

code with unknown signature is polymorphic viruses)(col. 2, lines 1-2 and lines 21-29).

Regarding claim 142, Chess discloses the system of claim 127, further

comprising program instructions executable by the processor to:

determine from the first and second scores that the code under investigation is

valid code (i.e., files determined to be non-malicious)(col. 5, lines 55-67 and col. 6, lines

1-21).

Regarding claims 144 and 149, Kouzentsov discloses the system of claim 127,

further comprising program instructions executable by the processor to:

determining from the score that the code under investigation is suspicious code

(i.e., the categories of the events that are monitored, e.g., events 1-9, col. 5, lines 25-40

may or may not be malicious depending on the repetitions of suspicious behavioral

patterns ... the observed group of suspicious events could "potentially" be

malicious)(col. 4, lines 38-67 and col. 5, lines 1-67 and col. 6, lines 1-30).

Regarding claim 145, Kouzentsov discloses the memory medium of claim 128,

further comprising program instructions executable to:

determining from the score (i.e., repetitions of suspicious behavioral patterns)

that the code under investigation is malicious code (col. 5, lines 43-58 and col. 6, lines

63-67 and col. 7, lines 1-10).

Chess discloses determining from the scores (i.e., matches between code under

investigation and the records of database 210 of known non-malicious files or the

records of database 220 of known malicious code descriptions) that the code under

investigation is malicious code (col. 6, lines 5-35).

Regarding claim 146, Kouzentsov discloses the memory medium of claim 145,

wherein the malicious code is a previously unknown type of malicious code (i.e., a

knowledge of specific, pre-identified computer viruses would not be necessary because

behavioral patterns typical of computer viruses are observed. An example of malicious

code with unknown signature is polymorphic viruses)(col. 2, lines 1-2 and lines 21-29).

Regarding claim 147, Kouzentsov discloses the memory medium of claim 128,

further comprising program instructions executable to:

determine from the first and second scores that the code under investigation is

valid code (i.e., static analyzer 52 performs behavior checking and generates alerts and

histograms only if patterns of suspicious events are observed)(col. 4, lines 38-67 and

col. 5, lines 1-40).

Regarding claims 134, 136, 137, 141, 143, 148, 150, 153-158, and 162-166,

Kouzentsov discloses determining from the score (i.e., repetitions of suspicious

behavioral patterns) that the code under investigation is malicious code (col. 5, lines 43-

58 and col. 6, lines 63-67 and col. 7, lines 1-10).

Chess further discloses wherein the determination that the code under

investigation is malicious code is based on the first score not exceeding a valid code

threshold value (i.e., matches between code under investigation and the records of

database 210 of known non-malicious files) and the second score exceeding a

malicious code threshold value (i.e., matches between code under investigation and the

records of database 220 of known malicious code descriptions)(col. 6, lines 5-35).

Chess further discloses clustering files within each classification by using a code-

similarity metric to determine the similarity of the possibly-malicious code in each file to

the corresponding code in the other files and grouping together those files which are

closest according to the metric (col. 7, lines 33-46).

Regarding claim 149, Kouzentsov discloses the memory medium of claim 128,

further comprising program instructions executable to:

determine from the first and second scores that the code under investigation is

suspicious code (col. 4, lines 38-67 and col. 5, lines 1-40).

Claims 109-114 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Kouznetsov, (U.S. Patent No. 6,973,577), in view of Chess et al., (U.S. Patent No.

6,772,346 and Chess hereinafter), in further view of Hill et al., (U.S. Patent No.

6,088,804 and Hill hereinafter).

Regarding claims 109-114, Kouznetsov discloses the method of claim 105,

wherein the malicious code includes monitoring software (i.e., events such as system

calls having the ability to monitor system input/output activities are monitored)(col. 5,

lines 18-67 and col. 6, lines 1-30).

Chess discloses wherein the malicious code can include computer viruses,

worms, or Trojan Horses (col. 3, lines 51-53).

Hill further discloses that security event types may include destructive virus,
snooping virus, worm, Trojan Horse, FTP requests, and network overload (col. 5, lines
59-61).

It would have also been obvious to a person of ordinary skill in the art at the time
of applicant's invention to modify the combined teachings of Kouznetsov and Chess
with teachings of Hill because it would allow to categorize the code under investigation
(i.e., simulated attacks – wherein a simulated attack includes at least one of security
event types) with respect to the likelihood of the code under investigation compromising
the security of the computer system as disclosed by Hill. One of ordinary skill in the art
would have been motivated by the suggestion of Hill to provide knowledge of severity
and overall nature of attack (Hill, col. 2, lines 45-60).

Conclusion

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Arezoo Sherkat whose telephone number is (571) 272-
3796. The examiner can normally be reached on 8:00-4:30 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for
the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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